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Hamiltonicity of SDR graphs and colouring graphs

Given a collection of sets S , the SDR graph of S is the graph whose vertices are systems of distinct representatives (SDRs) of S , with two SDRs adjacent if they differ in the representative of exactly one set. Given a graph G and an integer $k \geq \chi(G)$, the k -colouring graph of G is the graph whose vertices are k -colourings of G , with two colourings adjacent if they differ in the colour of exactly one vertex. We give results on Hamiltonicity and connectivity of such graphs, and relate them with an examination of colouring graphs of complete multipartite graphs.